

THE SCIENTIFIC THOUSAND ^① AND ONE NIGHTS

Translated by
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Once upon a time there lived a Sultan in a magnificent palace in a distant part of the Orient. He had everything, gold, women, magnificent horses. But each night he could not sleep because he asked himself all sorts of questions to which he could find no answer. Each night he called for his grand vizier, Schatzmani.

Schatzmani, listen, last night in a dream I saw a very strange object. It was split down the middle

and that made just a single object!

A single object my lord, but that's impossible

I saw it! I want this object. It exists. Find it. Your life depends on it. I'll give you three days!

But... Lord!

If you do not bring this object within three days, I will send you to the executioner.

The Sultan is not joking, because of his terrible insomnia!

Lanturlu!

Here's the grand vizier. What have I done this time?

Ah!

You have three days, not one more, to invent an object that when split according to its median part, just makes one

If you cannot, then I shall have you put to death!

But... Master, I'm just a valet...



It's obvious that Schatzmani wants me dead. It is impossible to find such an object because it doesn't exist. If I cut through this bracelet according to its median line, I get two cylinders and not just one band.

I've travelled throughout the kingdom and I have seen nothing that could resemble what your master, the vizier Schatzmani, is asking for.



Effectively.

The third, fateful day arrived.



There Alethea, night is falling. Tomorrow, at dawn, Schatzmani will have my head cut off. What can I do between now and then? Hmm, I was polishing the copper, I might as well carry on.

By Allah, this lamp is very dirty, completely oxydised. I'll have to rub hard to get it to shine.



And Anselme Lanturlu rubbed the lamp...

Ah, a bit of air at last...

By the prophet, who are you?!

My name is Sophia. I live in this lamp.

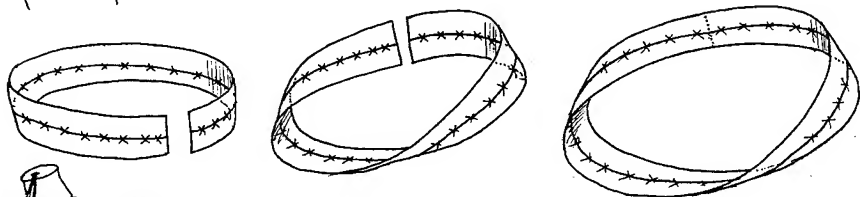
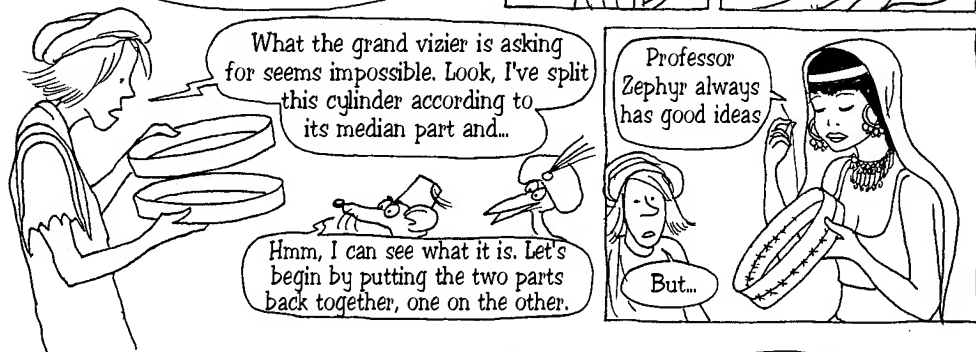
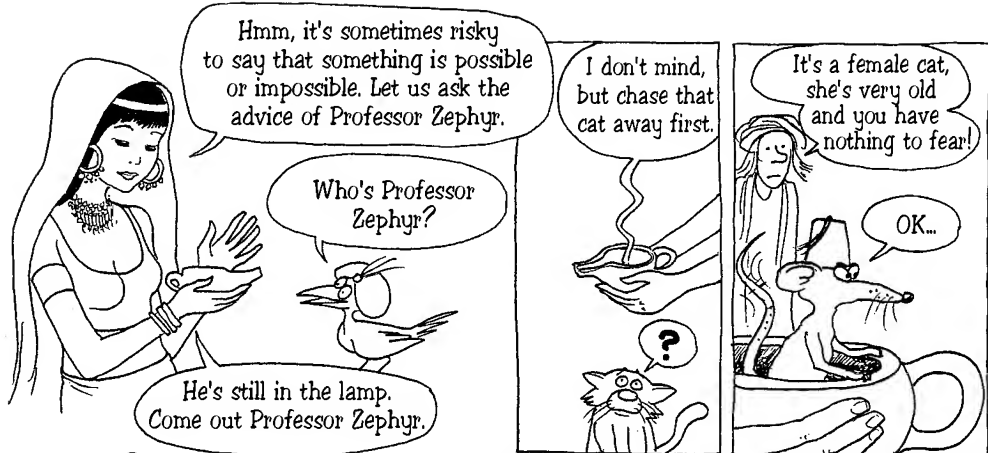
What?!? You live in this old oil lamp?

Yes, it's a complicated story that I'll tell you another time. For the moment, what is your problem?

Miah!



Schatzmani, my master, told me that he will have my head cut off tomorrow morning if I don't find an object that when split according to its median line will give a single object. Well, I know that that is impossible. So at dawn I'll be handed over to the executioner.

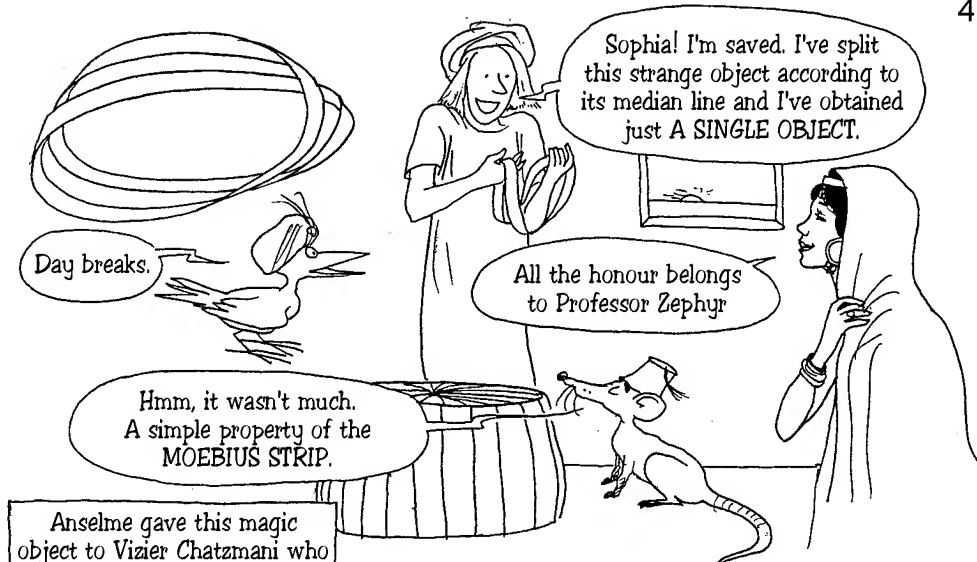


Now we cut the strip. We'll give it a halfturn and stick it back on itself, as shown in the drawings.



But that changes everything dope. Now remove the stitching and you'll see.



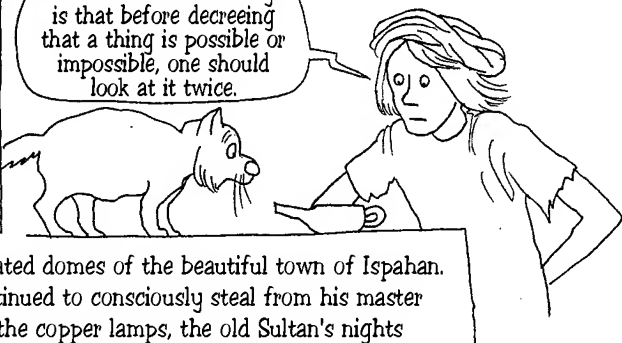


Anselme gave this magic object to Vizier Chatzmani who then took it to the Sultan, who considered himself satisfied

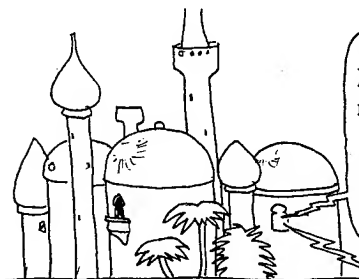


Sophia and Professor Zephyr went back into the lamp, telling Anselme that if he needed them, he just had to rub the lamp again and they would come back to help him.

The moral of this story is that before decreeing that a thing is possible or impossible, one should look at it twice.



Calm returned under the gold plated domes of the beautiful town of Ispahan. But while Vizier Schatzmani continued to consciously steal from his master and Anselme continued to clean the copper lamps, the old Sultan's nights were once more haunted by strange, piercing dreams.



Schatzmani, last night something strange happened: I blew on an object and instead of it flying away it came towards me. The more I blew, the more it stuck itself on me. Go, and bring me this object. It exists because I saw it in my dream. Bring it to me within one moon, if not you'll reply with your life.

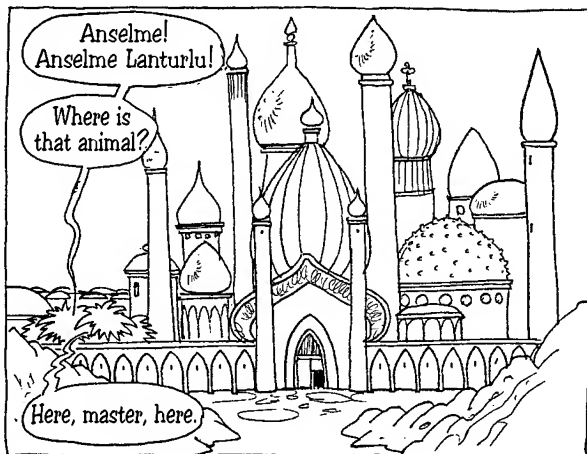
!?!?

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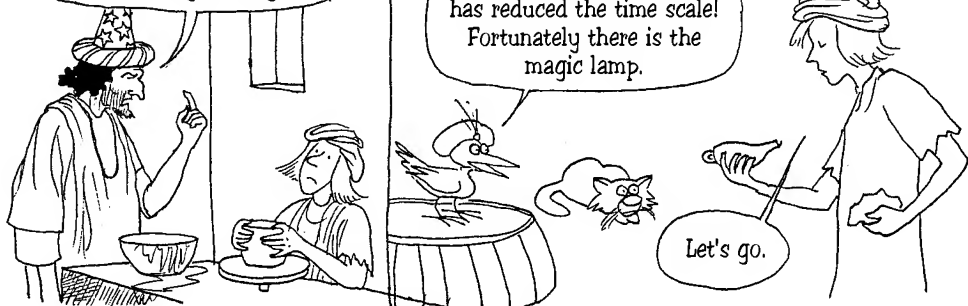


Schatzmani, the grand vizier, is in a very bad mood.

Anselme, within two days you must find an object such that when you blow on it, it comes towards you instead of moving away, if not I'll have you hung.

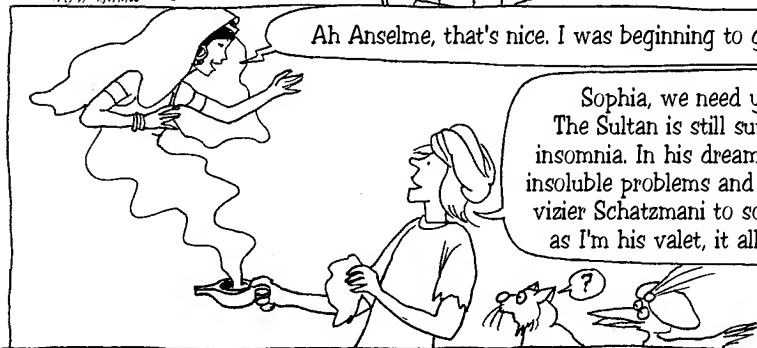


Two days? The Sultan has reduced the time scale! Fortunately there is the magic lamp.



Ah Anselme, that's nice. I was beginning to get bored.

Sophia, we need you again. The Sultan is still suffering from insomnia. In his dreams he imagines insoluble problems and asks his grand vizier Schatzmani to solve them, and as I'm his valet, it all falls on me.



Bizarre. When one blows on an object, generally it flies away.

Hmm, this is beyond my competence. We'll have to visit Doctor Aircurrent. For that we'll make a flying carpet. We need a big, square carpet to start with.

We'll begin by rolling the sheet on itself, like this:

up to the diagonal.

But first we'll make a model.

Then we break the edge so as to be able to roll it.

We then fix the two points with adhesive tape.

And so make an **EPISCOPLANE**.

PROFILE view

back

front

FRONT view

Hold it at the back and launch it gently, nice and flat.

parallel to the diagonal of the paper, fold of the paper,

Is it a hat?

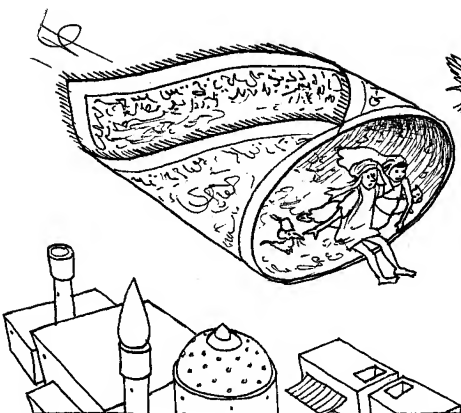
Non, it's a flying machine.

If the EPISCOPLANE is made carefully, it will fly perfectly over a long distance. You mustn't throw it violently but give it just the necessary speed, as if you were placing it on the air that will carry it.

There's a thing ?!?

There you are. Now that you've got the hang of it, let's get on to making it full size with a square carpet.

Taking the strange flying carpet conceived by Professor Zephyr, Anselme Lanturlu and Sophia go to visit Doctor Aircurrent.



Ah, just the right moment. I was setting up an experiment.

With apples?

I **BLOW** between the apples.

I've hooked both of these apples on a metre long wire, arranging them so that they are separated from each other by five millimetres.

NOT AT ALL

It's the Newton's apple thing. If you cut the wire it falls to earth.

You push air between the two apples and, instead of separating, they come together and stick to each other.

That's normal, in a gas, when speed increases, pressure drops. By blowing between the apples I'm creating a **DEPRESSION**.

Yes, but your air jet, you just need to make it turn as you wish.

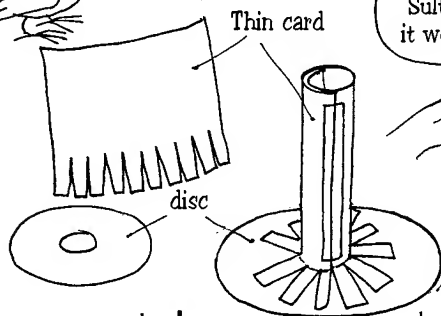
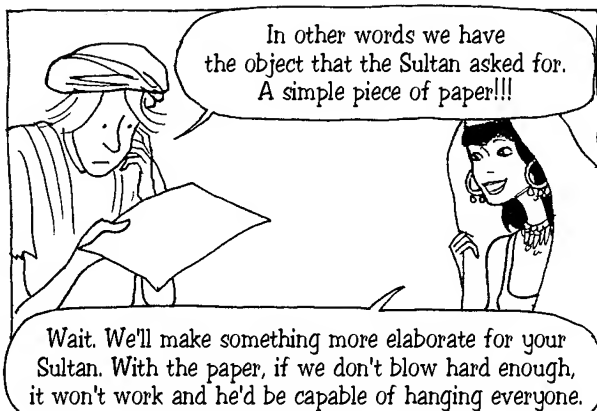
He's right.

Ah... how?

Yes, but on the sides of the air jet! In the axis, that pushes objects doesn't it?

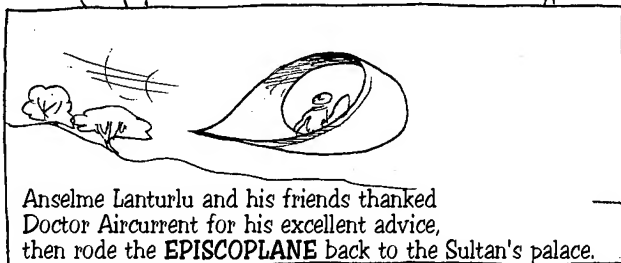
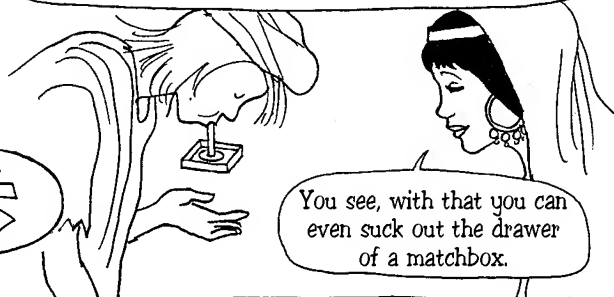
Look: I place this sheet of paper under my left hand. I put my mouth at the crook between my index finger and my middle finger, that I leave separated, and I blow as hard as I can. The air will be expelled, run along the edge of the sheet and create a depression there. And if everything goes as planned...

But you're blowing **ON** the sheet...



We need to use glue or adhesive tape to connect a cylinder to a disc pierced with a round hole.

1/1 scale



THE ASPIROBLOWER

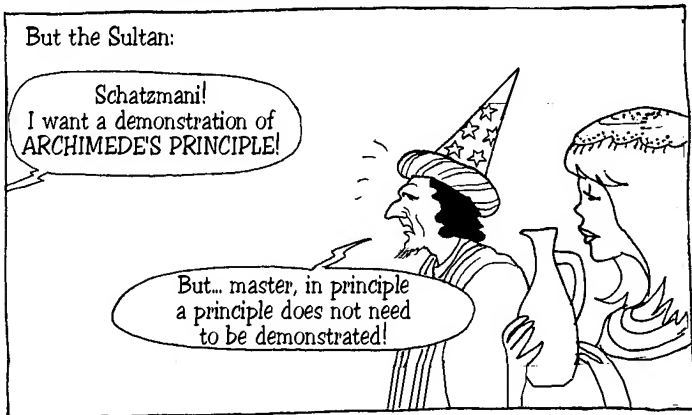
Sophia and Professor Zephyr returned to the lamp.



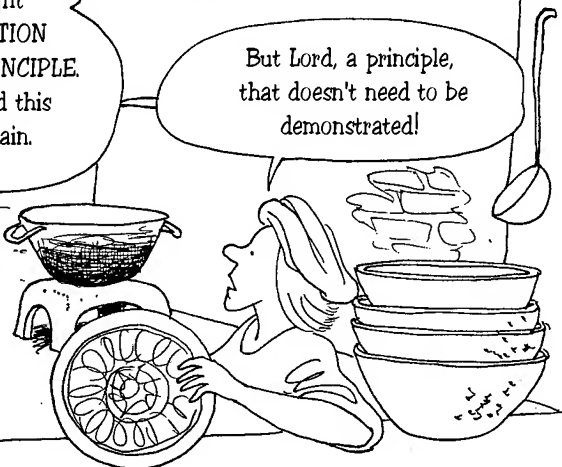
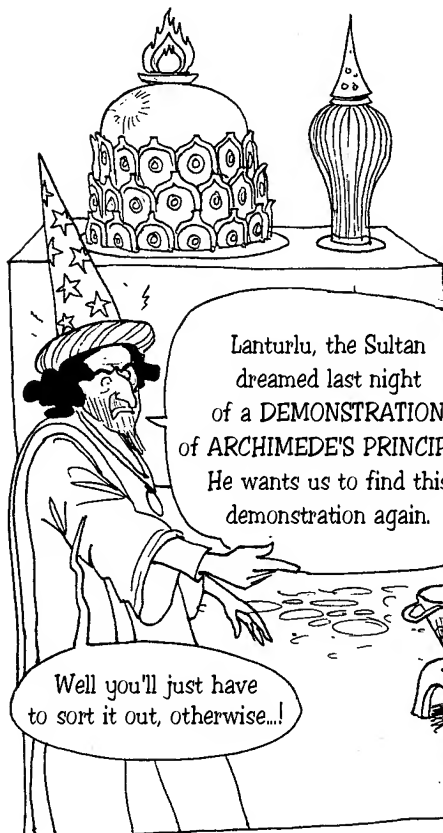
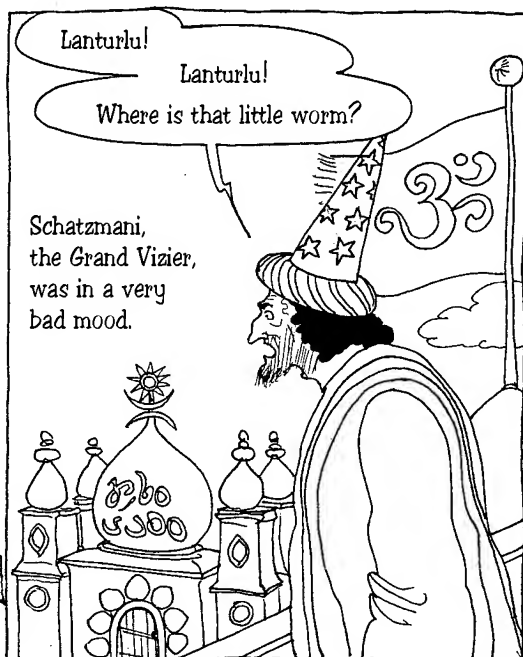
But the Sultan:

Schatzmani!
I want a demonstration of **ARCHIMEDE'S PRINCIPLE!**

But... master, in principle a principle does not need to be demonstrated!



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Demonstrate a principle, pff...

A body immersed wholly or partially in water receives a thrust from the bottom to the top equal to the weight of the water displaced

(around 210 B.C)

This looks complicated.
We should call Sophia.

Here's the magic lamp.

Here I am Lord.
How can I be of service?

What is this
building site?...

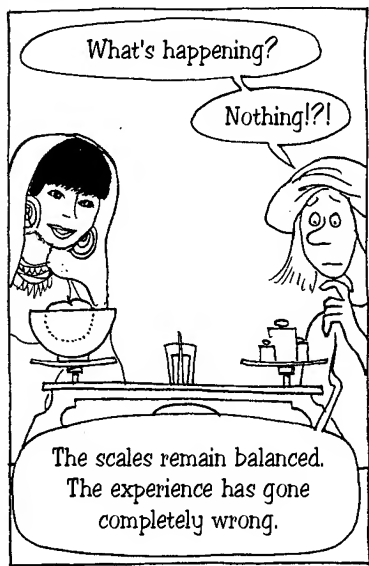
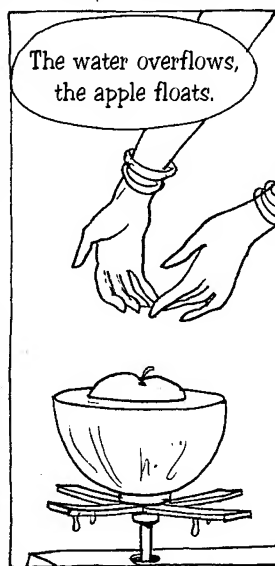
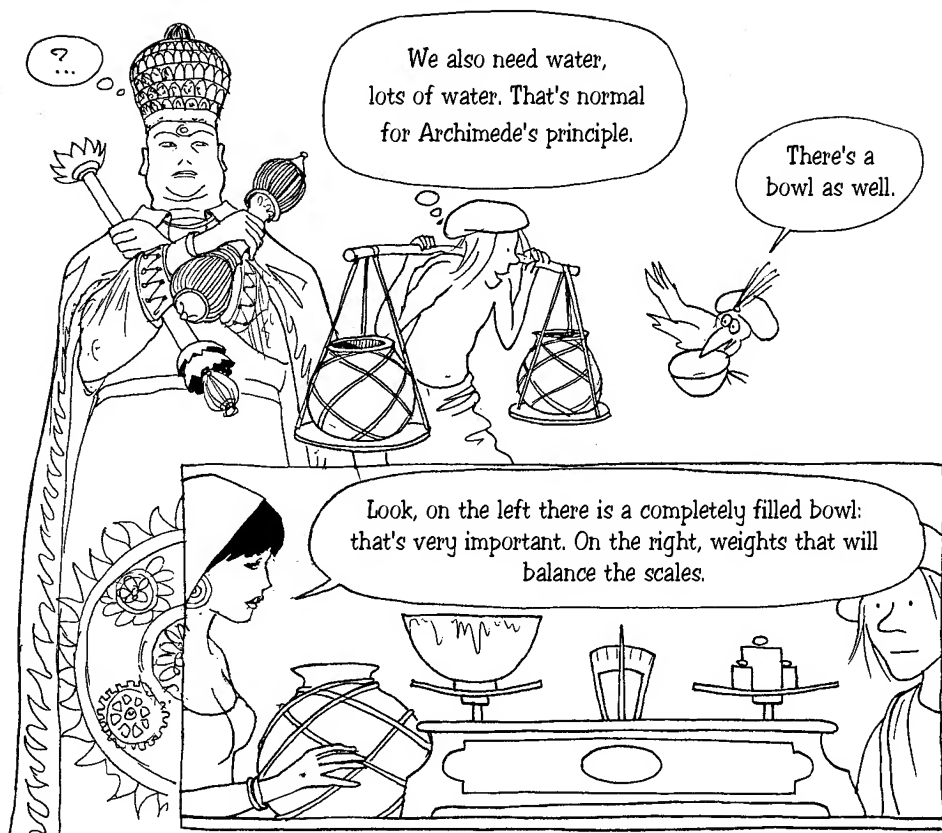
Sophia asked for
very precise material

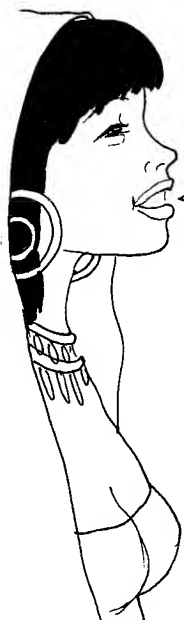
Scales

Weights

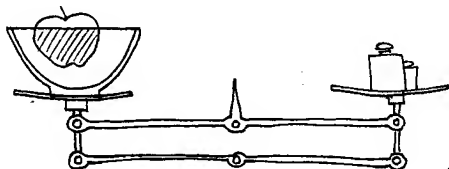
An
apple







No, on the contrary, the experiment worked: the apple is floating so "Archimede's thrust" balances its weight. And what is the value of this thrust? If we believe the scales it's the weight of the displaced water, which overflowed from the bowl when I put the apple in.



Eureka!



We have demonstrated **ARCHIMEDE'S PRINCIPLE!**

Schatzmani went to tell the Sultan that his dream had been elucidated and in return he was gratified. Anselme went back to his cooking pots.

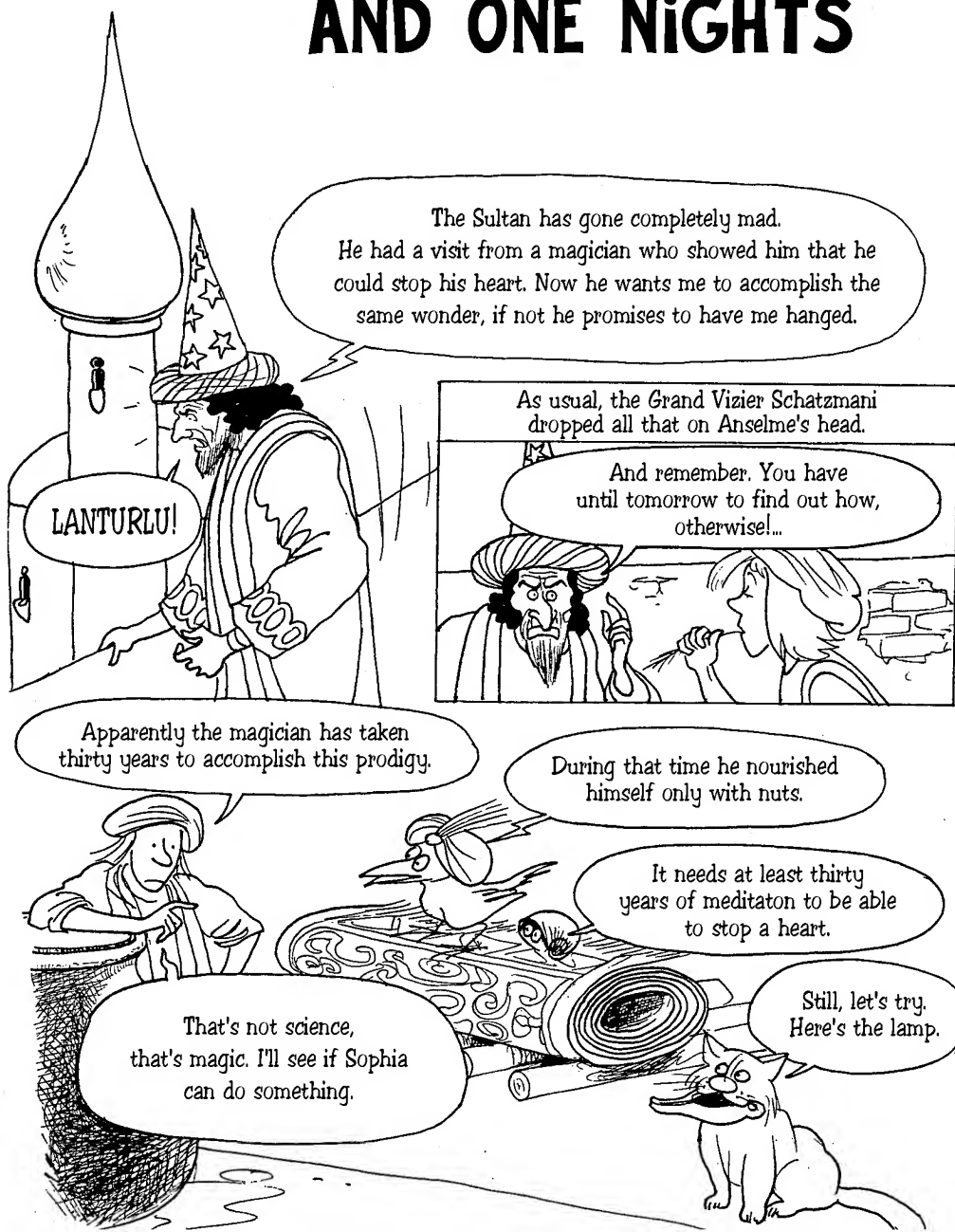



Luckily, the apple was less dense than the water. If it had been the contrary, goodbye the fine demonstration.

Hmmmm




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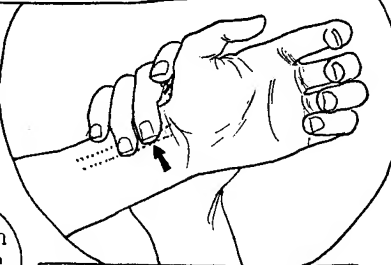




Ah my dears, I heard you from the bottom of my lamp and I admit it made me laugh. Your magician is a clever trickster. How did he show that he had stopped his heart?




Well, he asked that his pulse be taken...




And what connection is there between the pulse and the heart?


How to take a pulse




In theory, blood vessels, an artery that carries blood.




Do you mean that that's how he stops his heart, by stopping blood flow from his heart to his wrist?




But with WHAT?



With THAT



But that's just a walnut!?!



Does this nut have pharmaceutical properties?

Nothing to do with it.
You place the walnut under
your armpit, where the artery
passes that brings fresh blood
to your arm.

No one notices
and if I don't I press
my arm against my
body, you feel
a normal pulse.

But if I imperceptibly press the nut
in my armpit, the artery is compressed.
Blood no longer passes and you
can no longer feel my pulse.

My goodness,
it's true!

When I think that this rascal magician, in tricking our Sultan, received a full purse of gold by making him believe that he had special powers...

Ah hah. So that's where Lanturlu gets his knowledge from:
a magic lamp, a sort of genie, hidden in the lamp, a woman

But the abominable Schatzmani was perched
on the roof of the Science Academy...

Hmmm... very clever.

It just remains to go and see
the Sultan. But there is no need
for me to explain the trick with
the walnut under the armpit

OK valet.
Now return to your duties and take this coin.

Oh, thankyou!

Schatzmani gave me a coin.
Maybe he isn't so bad
after all...

Pfff... it is just
a copper sou

Anselme! The magic lamp
has disappeared!

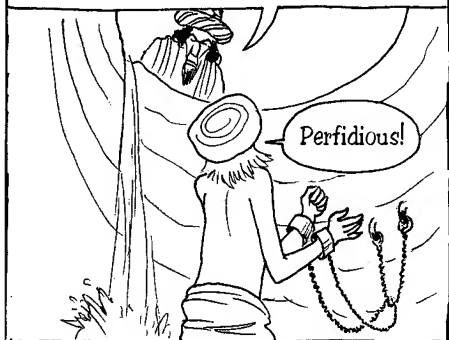
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So this is the magic lamp from which Lanturlu gets all his knowledge. I just need to rub it, the genie will come out of the lamp and solve any problem.

I don't need you anymore. By the time this water has filled the cistern you will no longer be a problem for me.



Perfidious!

Lord, test me. I have acquired so much science that I believe I can solve any of your enigmas.



Well, I shall call you when a new enigma appears in one of my dreams.



This chain is too strong! I can't free my wrists. I'm done for!

Anselme... I can't help you directly because I am shut in the magic lamp, but know that this problem has a solution.



A solution?!? But Sophia!
It is EVIDENT that this problem
has no solution and that I'm
condemned to death.



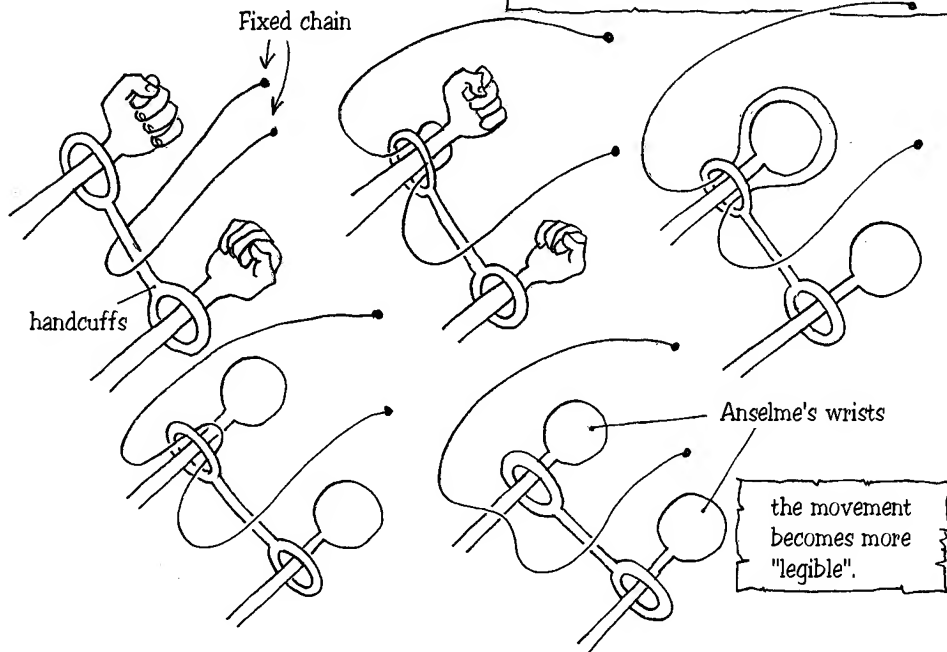
Don't get excited.
You can release yourself... because
you aren't really attached...

What!?!?

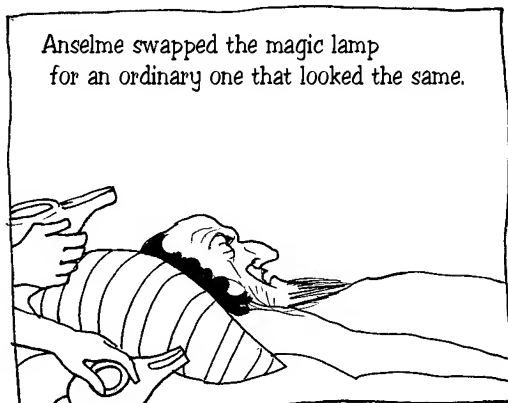
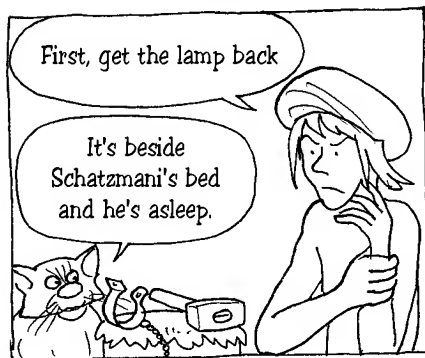
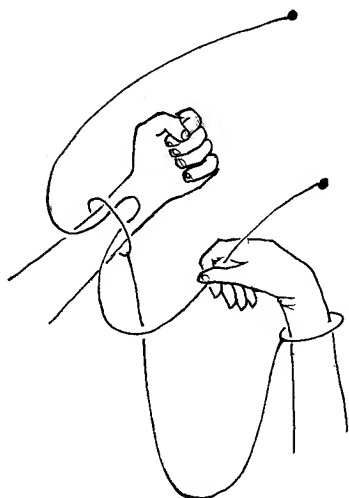
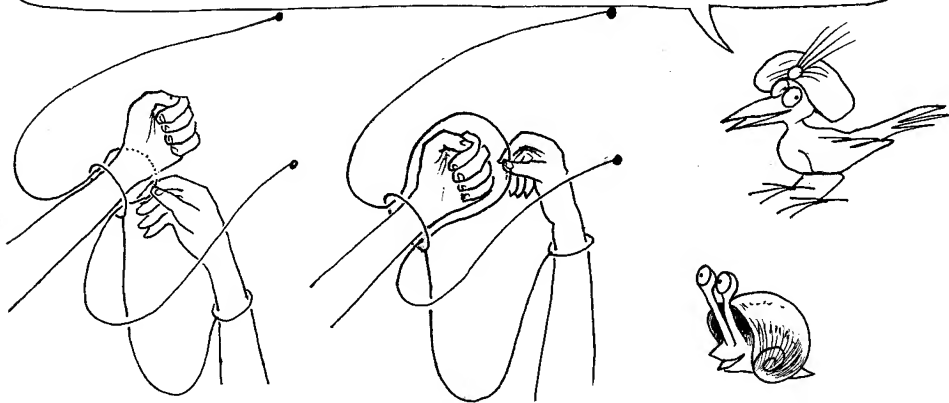
Reflect: You can't free your wrists from
the handcuffs but, however, the chains can go
between them and the skin of your wrists.

On reflection, Anselme ended up
finding the solution

We've deformed the handcuffs and
Anselme's wrists so that

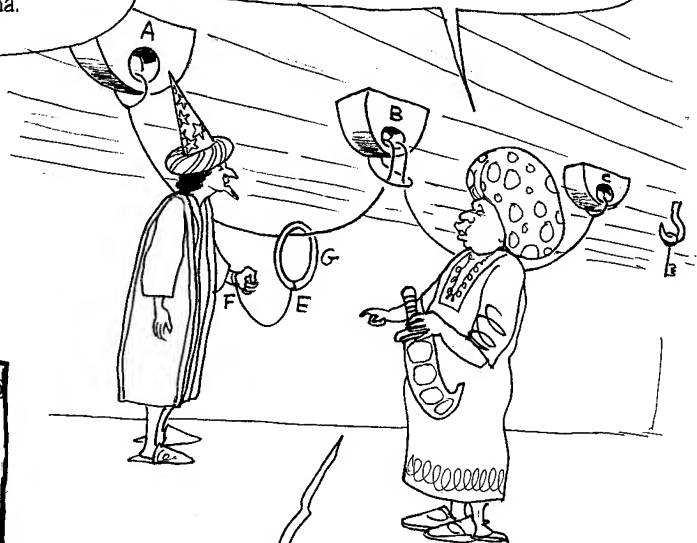


In order that the readers be able to do this trick easily themselves, using string, we have shown Anselme's handcuffs as simple rings of knotted cord.



What a fine morning.
Let's go and see if the Sultan
has had a dream with a new
scientific enigma.

The Sultan dreamed that he was
attached in this way. He dreamt that he
found the key and freed himself.



Ah, a precision: The ties A, C, F and E cannot
be undone and the ring G, rigid, will not go
through the hole B in any way.

Obviously, it's impossible
to reach the key by simply
pulling on the cord

Now all I need to do
is rub the lamp.



Huh? NOTHING! Yet I've been
rubbing it for over an hour!

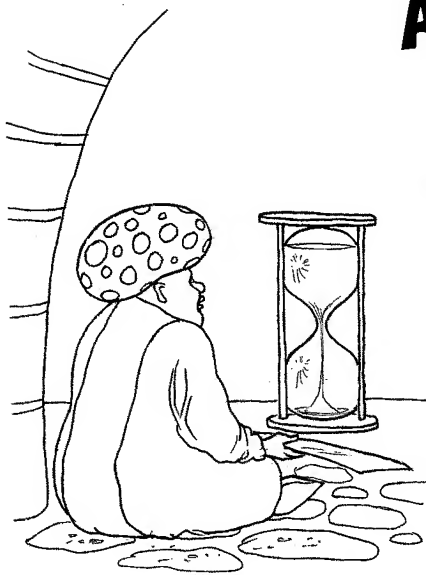


And yet this problem has a solution
(see the next episode)

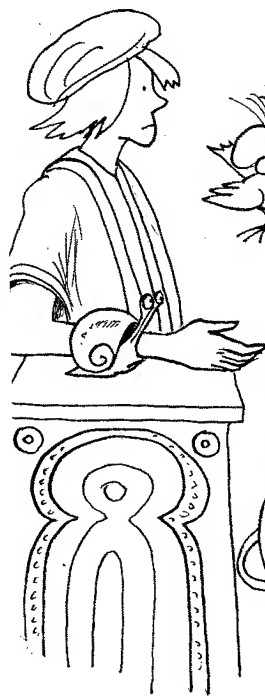


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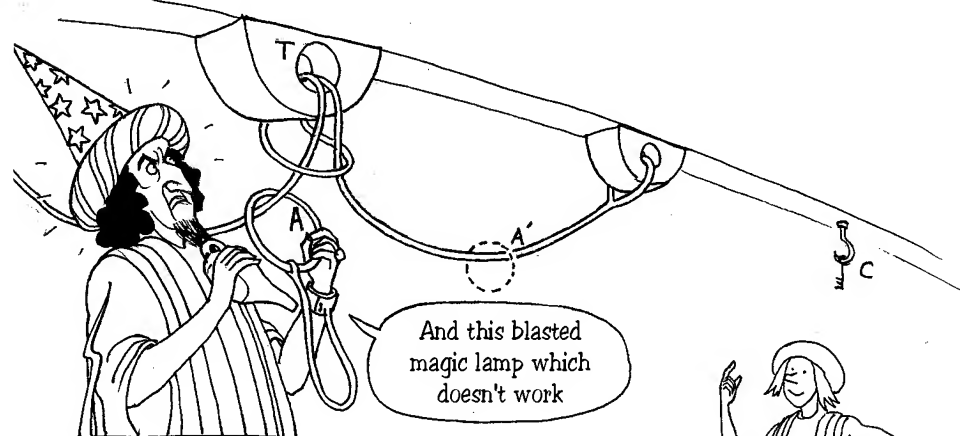
Schatzmani has entrapped himself. As he believed he had a magic lamp, he told the Sultan that he would be able to solve any enigma. But as he didn't have the right lamp he remained attached like an idiot and, when night fell, if he hadn't managed to free himself by then, the Sultan intended to simply cut off his head.



Hmmm...

Let us consult Professor Zephyr.





Ring A, to which I'm attached by this cuff, cannot pass through the hole T. I could never put the ring in A', and so be able to reach the key C and free myself.

Master, you aren't using it properly.

You have to put the lamp next to your ear, like that, and you'll get an explanation.

But!... I can't hear anything!?!?

I'll explain how you can get out of this difficult position.

Quickly, give it to me!

You must be going deaf.

Yes... Yes... that's it...

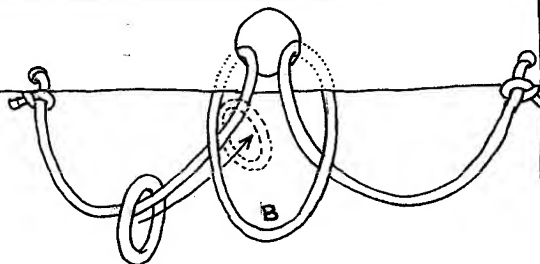
Look at the problem to which Schatzmani is attached. He's attached by a handcuff M to a ring A, which will not go through the hole T. He has to be able to pass ring A in A' in order to be able to reach the key C of his handcuff and free himself.

But it is IMPOSSIBLE, BECAUSE ring A CANNOT GO THROUGH hole T!

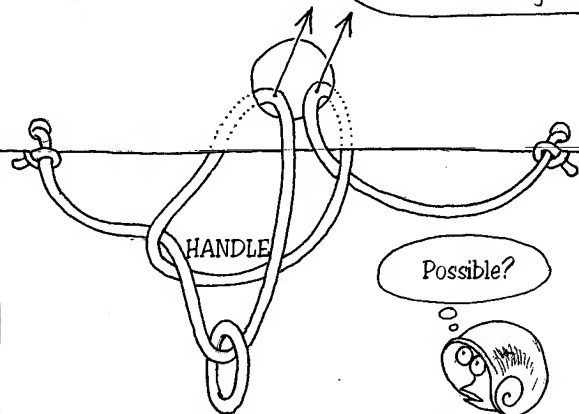
Try it with a piece of thick card, string and a large curtain ring



Let strand B hang down so as to be able to pass the ring as shown.

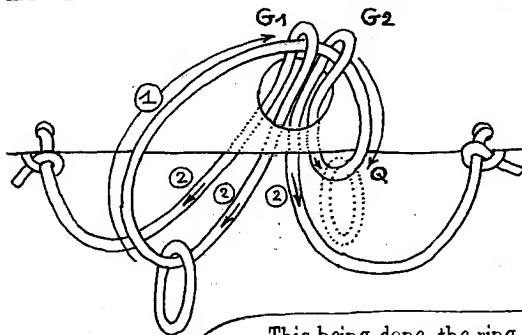


We will call this the "ring waiting position". Now you have to pull hard on the strands (arrowed) to be able to pass the handle A through the hole.



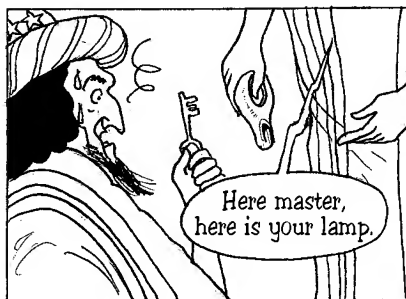
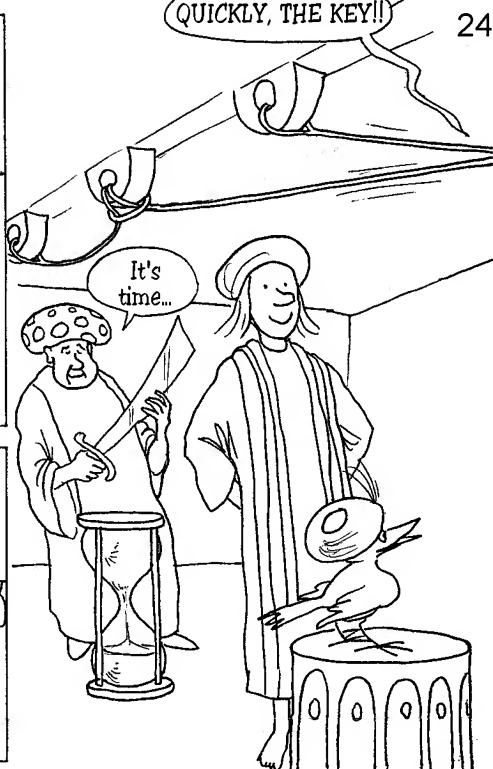
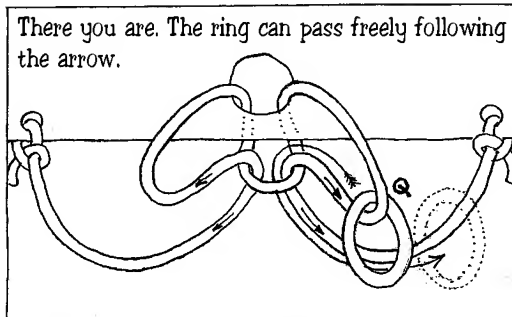
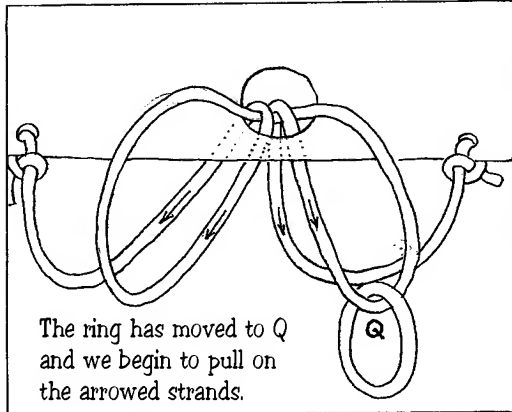
Possible?

Mi!



This being done, the ring can pass through the two braids G_1 and G_2 and reach the position Q . Then you just need to pull the arrowed strands to get G_1 and G_2 on the other side of the hole.






You haven't heard the best bit. Schatzmani went to see a magi to see about his hearing problems.

It seems that the Sultan had a dream in which a box moved on its own, without rope, without anything. It seems it could even climb up slopes.



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The Sultan said he had seen a magic box
in his dreams that moved by itself.

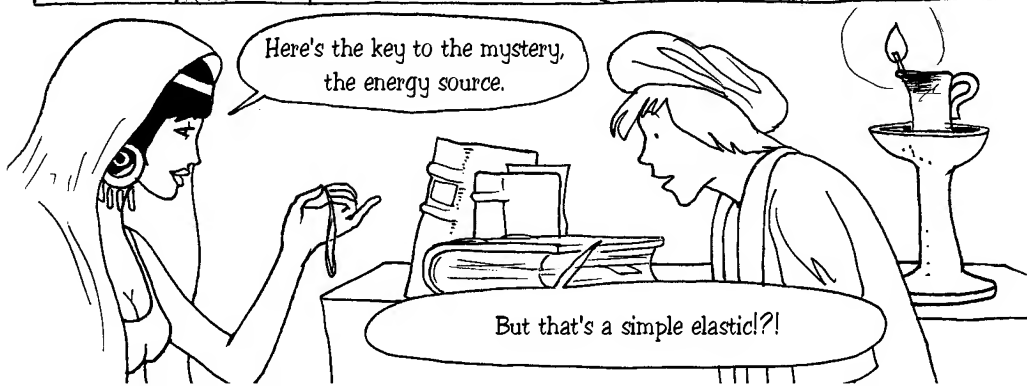
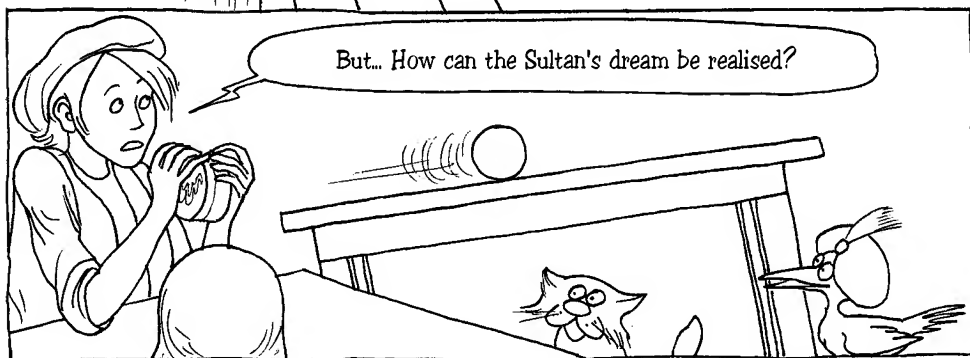
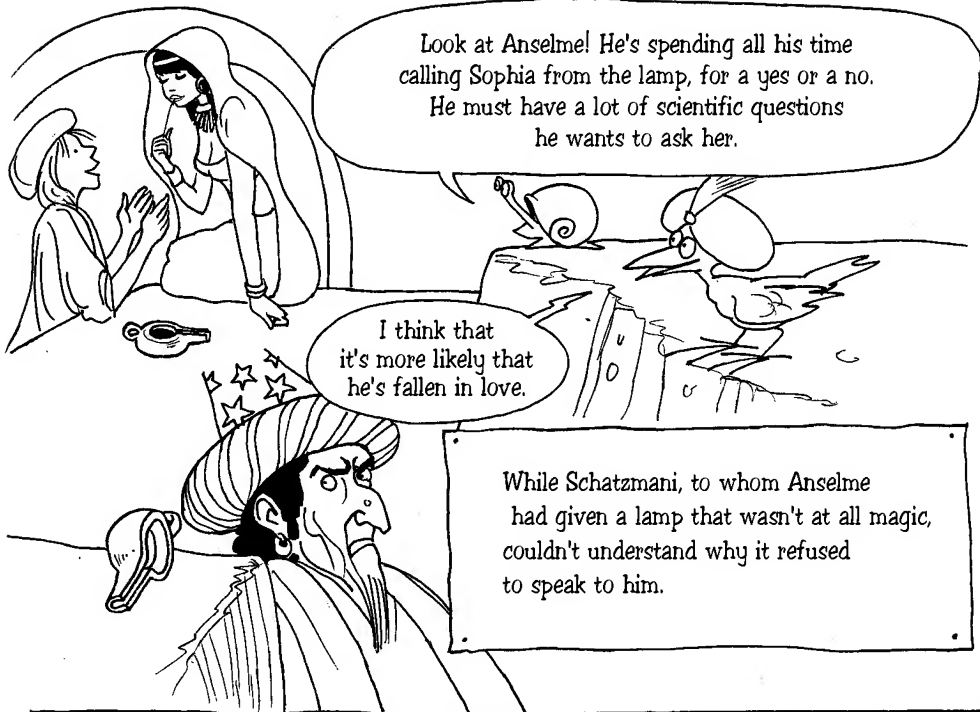
There must be some mischief
outside the box... A string?

Or a magnet?

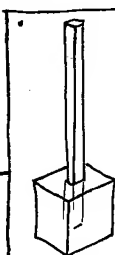
Not at all. Nothing electric either.
He said that all the mischief was
INSIDE the box.

I've got it! The box must be propelled by reaction.

Nor that. The Sultan had noted that this
rolling box did not emit any wind nor did it raise
dust as it went along. And it climbed slopes.

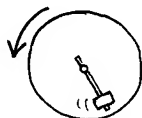
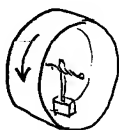


First a hole has to be made on each of the two sides of the box (**)



Then fix a small, heavy object on the end of a match, which will serve as a counterweight (lead is ideal).

The match has to be blocked into the elastic ring, like this. This is then fixed in the centre of the sides of the box, so that it is slightly stretched (**)



Then we turn the box in such a way as to "wind up" the elastic.

It can even go up slight slopes, until it stops.

This thing is diabolical!

If you put the box down gently, it will start to roll.

Amazing!



(*) A metal box, for pills or honey sweets.

(**) The elastic needs to be thin and supple!

No Tiresias, it's MECHANICAL.

OK, let's go and explain
all that to poor Schatzmani,
who must be moping by the side
of a desperately mute lamp.

Ah, he's asleep. He must have been thinking.
That always tires him. I'll rewind the box
and block it with this lamp.

By the tears
of Allah, the box
has come out of the
magic lamp!

It moves by itself.
CHAYTAN (") must be
behind it!

Let's go and have a siesta.
It will be quite a while before
he understands how it works.

(") The Devil for Orientals.

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Now I put my hand just below yours, like this. You have to keep your hand completely open. If I manage to take the coin before you've closed your hand, it's mine, if not I'll give you another one.

His hand has a good distance to go to grab the coin, whereas I just need to fold my fingers. It's a stupid game and I should win easily.



He's already got three of my coins. I need to understand this. Quick, the lamp.



In my opinion it is all because the old fellow has the initiative. Your hand moves with a slight **RESPONSE TIME**. You need to see when his hand starts moving, then you give the order to yours to close. That takes **TIME**.

It's a bit difficult to explain: between your eye, your brain and your hand, there are nerves, where a **NERVOUS INFLUX** travels at a finite speed.

TIME!?!

So then, if I take the coin, I'm the one who wins! I'm going back to see the old man.

You want to begin?
OK, I accept. Go on.

Missed. You owe me another coin.

By Chaytan (*), you must have hooks for fingers for goodness' sake

Sophia, I don't understand anymore.
Is he really faster than I am?

No, but he has a very fast way of taking the coin.
I've been watching him.

(*) The Devil.

He doesn't "take" the coin,
he makes it jump and so gains
precious time, a tenth
of a second.

But... How!?!

When he brings his hand
down on yours, he hits it with
his fingers, like this.

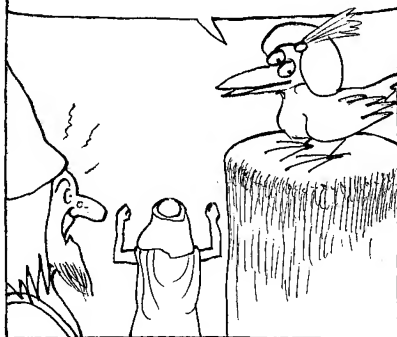


So your hand goes downwards
and the coin stays in the air

His hand then closes round the coin
and yours... on thin air



Anselme went back to see
the old money changer, won back
all his coins and many others.



THE SCIENTIFIC THOUSAND ⁹ AND ONE NIGHTS



He took my hand and made me touch the marble saying: "one equals two". And I could feel that there were two marbles.

There were two?

But no, there was just one. I checked. Explain this mystery to me.

But!...

This dream is sending me mad. Solve this paradox. If not you know what I will do.

Yes Lord, I know...

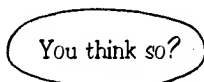
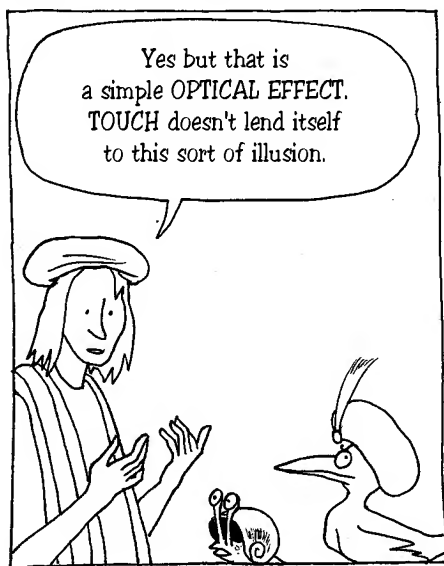
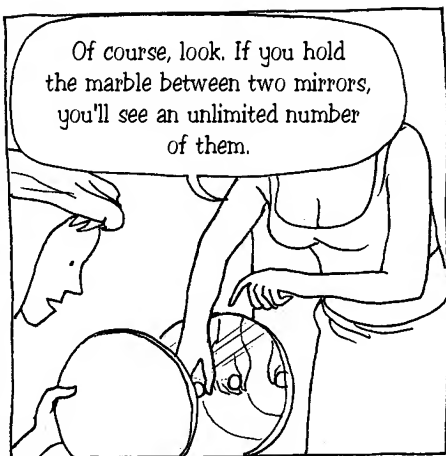
Why can't he have the same dreams as everyone else?

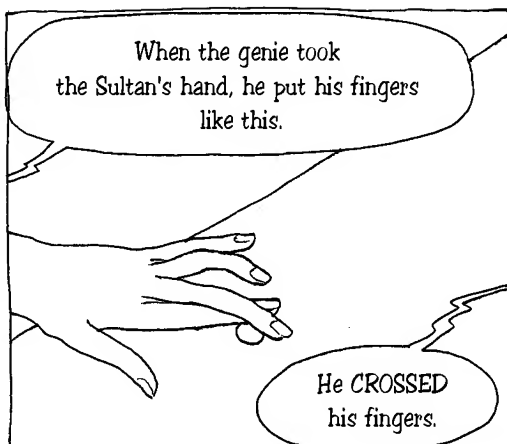
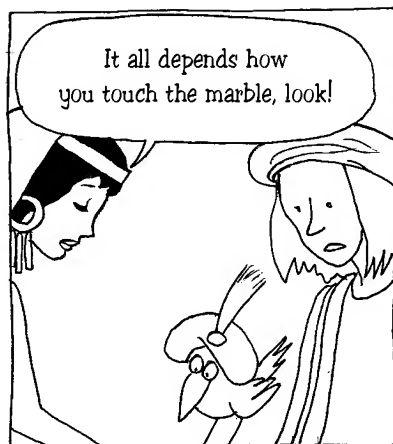
Go and find Anselme, quickly!

A marble that is one and two at the same time?!?

Maybe there's an esoteric symbolism that escapes us.

Let's see. When the Sultan SEES the marble, he is using his eyes and sees just one. But when he TOUCHES it, he FEELS two. They have two different meanings.





THE SCIENTIFIC THOUSAND AND ONE NIGHTS

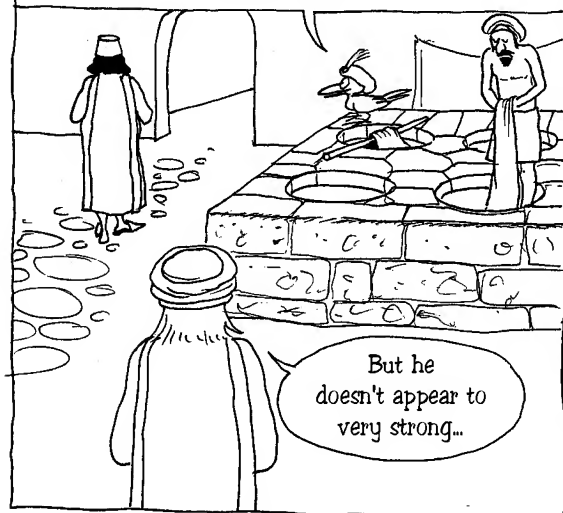


Yes, I'm coming,
what's the matter?



Look at that fellow, over there.

He's just won a whole purse of gold given
by the Sultan's very hand. In effect, he was able
to do something that no man in the kingdom
has been able to do since, even the strongest
and most skilful.



But he
doesn't appear to
very strong...

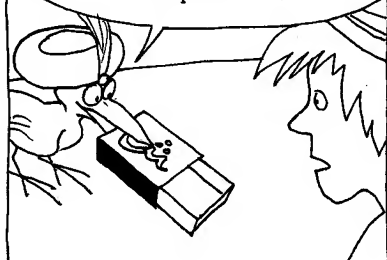
Schatzmani, when consulted,
said that he must have concluded
a pact with Chaytan (*) himself
to be able to operate such a prodigy.
He said that he has
"the Devil's hand"



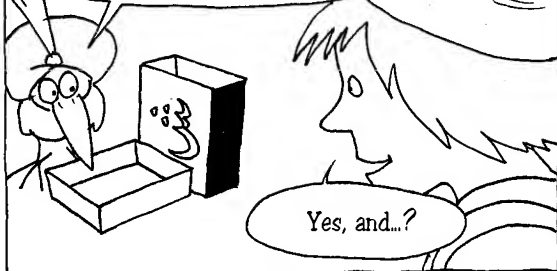
The Devil's hand!
What is this nonsense.
Tell me...

(*) The Devil

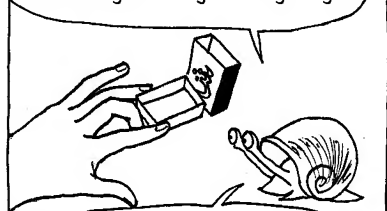
Well, he took this little box,
the one the Sultan puts
his spices in (*)



He took out the drawer
and put it down like this.

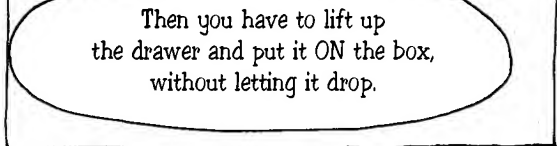


Take the drawer between your
index finger and your ring finger.



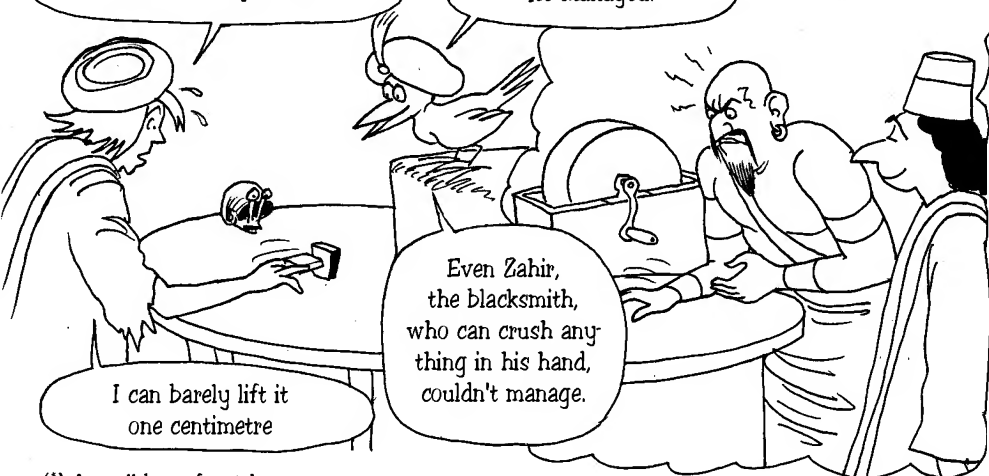
The middle finger must
IMPERATIVELY remain
in contact with the table.

Then you have to lift up
the drawer and put it **ON** the box,
without letting it drop.

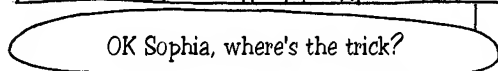
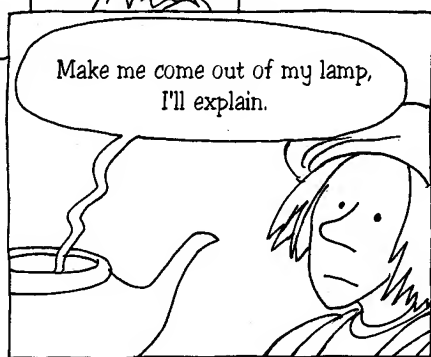
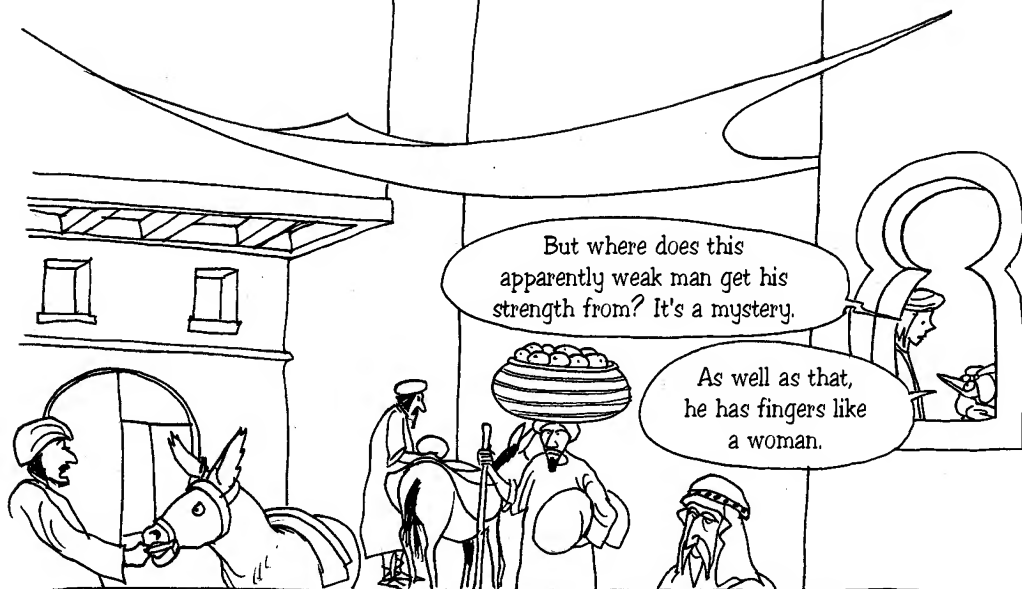



But... It's impossible!

He managed!




(*) A small box of matches.






But there has to be something because you manage and I can't.

Muscles work because of a **NERVOUS INFLUX**. And there you're sending it any old how. Carry on much more and they'll start to smoke.



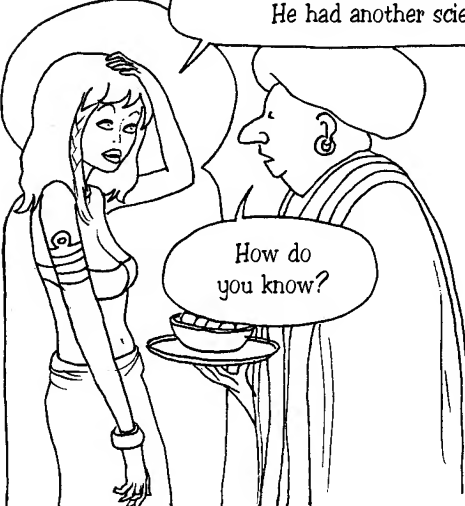
It's all a question of **APPRENTICESHIP**.

To succeed you have to learn to direct your nerve pulses towards the right circuits and coordinate them with your muscle actions.



Effectively!

THE SCIENTIFIC THOUSAND AND ONE NIGHTS



The Sultan is very agitated again.
He had another scientific dream last night.

How do
you know?

He can't stop fidgeting and me,
I couldn't get any sleep. He told me
about his dream early this morning

And what was the dream about?

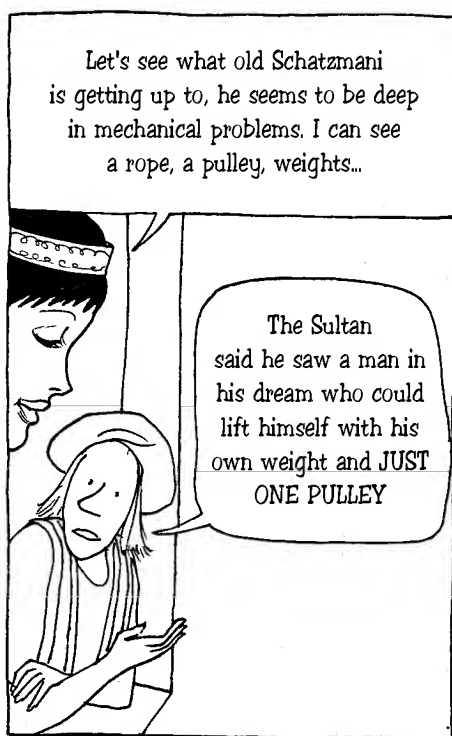
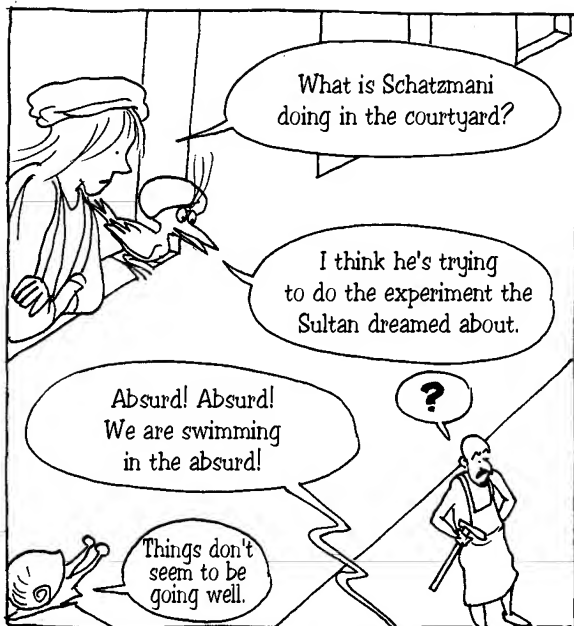
I didn't understand anything.
He said that "a man can lift himself up with
his own weight". But I'm just one of the
women of his harem, what do I know?

Each to their own speciality.
The Sultan's scientific fantasies,
they're Schatzmani's business.

And I'm just a eunuch.

Yes, you're right,
each to their speciality.
Your Turkish delight
is excellent!

Thanks!



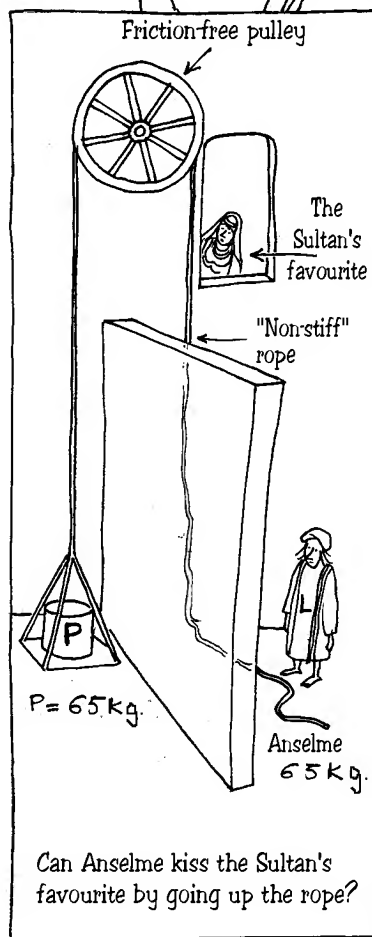
O venerated Sultan, excuse me but there,
I've cracked up. This experiment is impossible.

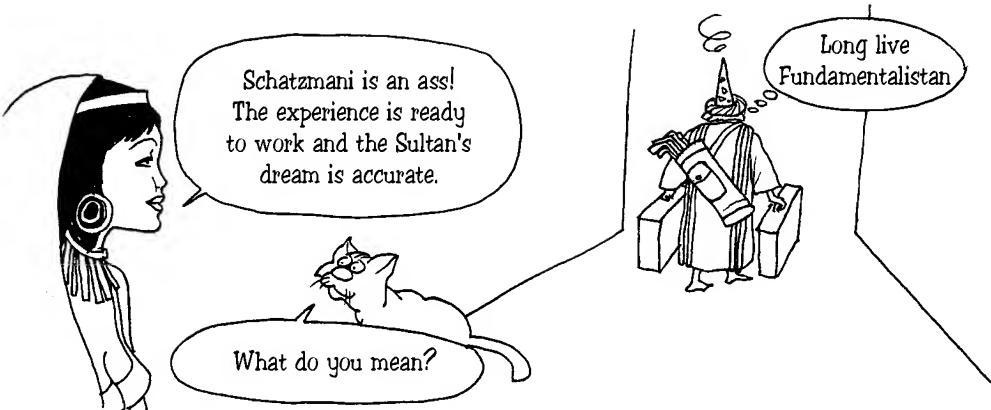
But because
I tell you I saw it
in a dream.

Light of the Orient, sovereign of Absurdistan,
it isn't a member of the Science Academy that
you need, it's a psychoanalyst. I prefer to resign.
I've got a job as the Grand Inquisitor in the
Science Academy of Fundamentalistan.

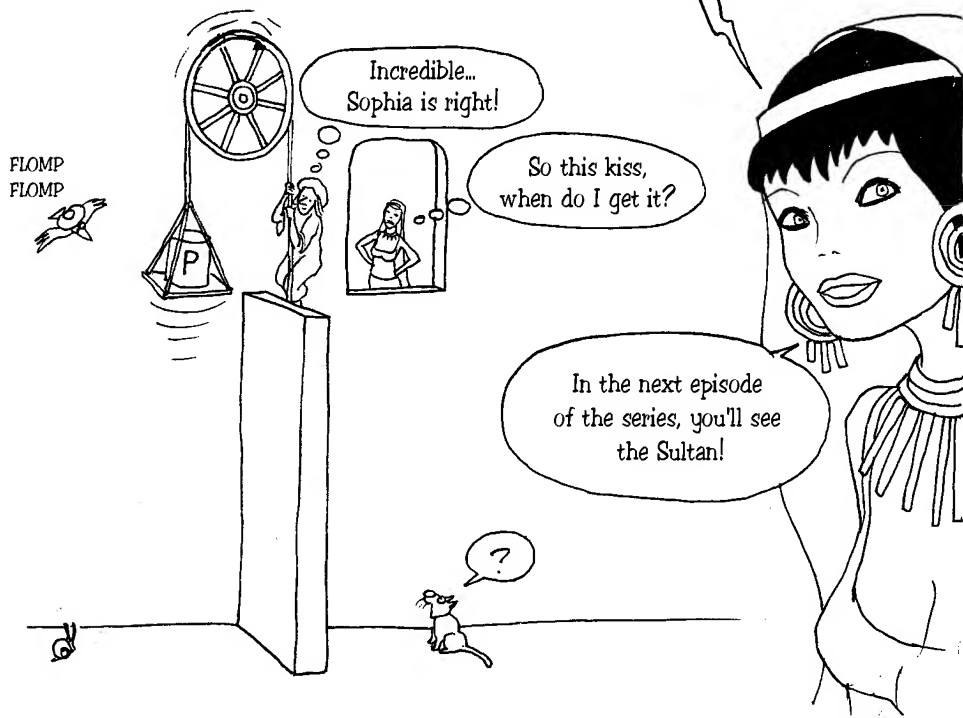
My hair has turned white and started
to go frizzy because of all these problems.
I'm fed up with these circumvolutions.

It's completely stupid. If $P > L$, then Anselme
goes up. If $P < L$ then it is the weight that goes up.
But if $P = L$, nothing at all will happen! I'm going
to become President of the Integratranal
Physics Society, here it's a madhouse.





Anselme weighs 65kg. The counterweight too. When he exercises any sort of traction on the rope, and as the pulley produces no friction, the force is transmitted to the weight and... to himself, by virtue of the Action-Reaction principle. If the force is inferior or equal to 65kg, **NOTHING** will happen. Neither the counterweight nor Anselme will be lifted up. But, as soon as the force that Anselme exercises is superior, both will rise because they are submitted to an **IDENTICAL** force and they have the same **MASS**.



THE SCIENTIFIC THOUSAND (12) AND ONE NIGHTS

Night was falling on ABSURDISTAN.



Look at the stars in the sky. For centuries men believed that the more brilliant they were, the closer they were, whereas in fact, the brightest stars are young stars, very emissive and sometimes very distant.



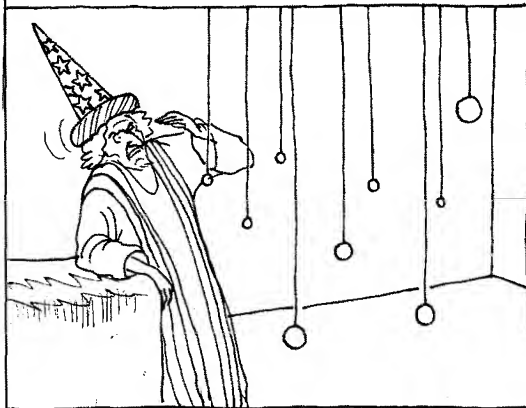
How knowledgeable you are Sophia!

They also believed that the stars were at the same distance as the planets, that is to say at "millions of leagues". They gave themselves a false idea of the Cosmos,



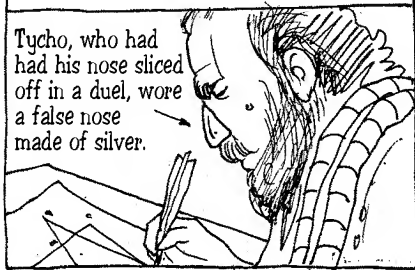
which they hung on to for a very long time.

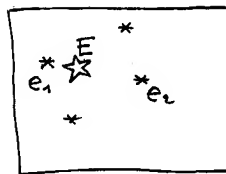
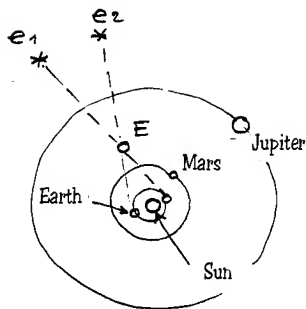
So people like Schatzmani said that Earth **COULD NOT** move because, if that had been the case, the closest stars should move in relation to more distant stars, through a parallax effect.



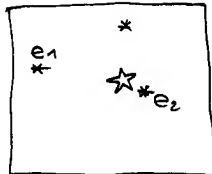
A Danish astronomer, Tycho Brahe, even showed "by calculation" that this idea of movement of Earth "does not resist analysis, because the vault of heaven is... immutable"!

Tycho, who had had his nose sliced off in a duel, wore a false nose made of silver.





Summer



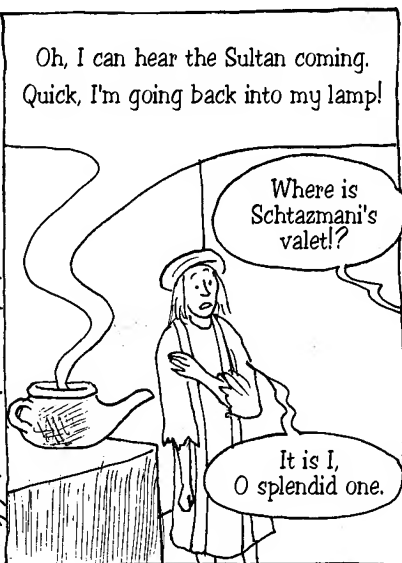
Winter



The reasoning founded on the parallax phenomenon:

That E a "near star" and e_1, e_2 , two distant stars. If Earth revolved around the Sun, the star E should project differently on to the "sky background" (stars e_1 and e_2) according to the seasons.

And that is exactly what happens in reality. But poor Tycho underestimated the distance of stars. If the solar system was the size of a dinar, the closest star would be at the edge of town. We had to wait until the nineteenth century and the invention of photography before Bessel was able to prove the phenomenon.



It is I,
O splendid one.

